# USE OF VR HEADSETS IN EDUCATION: A SYSTEMATIC REVIEW STUDY

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| Article Info | Abstract |
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| <br><br>Review Article | In recent years, it can be said that the use of new virtual reality related technologies increased swiftly. Especially virtual reality headsets have become an important device in virtual reality and augmented reality applications. As a consequence of these developments, researchers started to investigate the use of virtual reality headsets in many fields. In this respect, the purpose of this study is to perform a systematic review with content analysis on the articles about the use of VR headsets in education in the Scopus database between 2014 and 2019. A total of 49 related article were found and examined to determine the major topics, research methods/models, most cited papers, data collection tools, participants and variables in these articles. Because no systematic review study has been conducted on this topic in literature, the study is considered to be important. As a result, it was found that the number of studies about the use of virtual reality headsets in education tends to increase by year. In addition, it was seen that quantitative methods as research methods, undergraduate students as participants, and pretest-posttests as data collection tools were the most favored ones. Besides, it was found that usability and experience were the most preferred dependent variables.<br><br>**Keywords**: Content analysis, research trends, systematic review, virtual reality headset |

## 1. INTRODUCTION

Both hardware and software technologies of graphic processing have been developed substantially with parallels with technological developments in all areas. With these developments it is now possible to create virtual reality (VR) environments which are very similar to the real life. These environments include simulations, hologram, virtual life, virtual reality, augmented reality (AR) applications. The use of real-like simulations, which can be dangerous in real life, prevents material and moral damages. For example, piloting educations are performed with pilot simulations for a long period of time, and then trainees try to fly a real plane. These applications provide real-like virtual environments that the users feel it almost like a real life. This is called immersion which can be defined as an artificial environment that is convincingly enough for users to engage with it like it is real.

According to Bayraktar and Kaleli (2007), VR is a simulation model which is created dynamically in computerized environment in which users feel some kind of created reality and interact with objects and each other. VR does not have to be like real life. It can be different

with its own rules. Most of the VR applications are games. But it is also possible to see educational VR applications in use. According to ResearchandMarkets' 2018 report, VR game market will reach a value of US$ 32.8 Billion by 2023, which it already reached a value of US$ 8.2 Billion in 2017 (ResearchandMarkets, 2018). With this forecast, it can be said that VR will be an important technology in future.

One of the most important examples of VR is the Second Life application. Second Life was first released in 2003 by Linden Lab and had over a million active users in 2013. Second Life which is free to use is not a game. It is a virtual world with its own rules. There are virtual replications of many real things. For instance, some of the universities open and manage virtual campuses in Second Life. Educational activities like conferences, courses, etc. are organized. Users use 3d avatars, which are mostly 3d human like illustrations or cartoon characters, to interact with the virtual world. In second life, users can interact with each other, attend social events, build structures, buy, sell, do businesses. In Second Life, Linden Dollar is used in the virtual economy. Linden Dollar can be exchanged with real currencies in LindeX system. Consequentially, it can be said that Second Life is a huge virtual world with its own physical rules different from real world. In this virtual world it is possible to find a lot of interesting contents from education to art, from science to music.

Another topic about VR is VR headsets which support immersion at a very high level. In another market research, it is forecasted that VR headset market will reach a value of US$ 37 in 2020 which it already reached a value of US$ 7 Billion in 2016 (Statista.com, 2018). In the market, Playstation VR, Oculus Rift and HTC Vive are the most favored VR headsets. Figure 1 shows the market share.
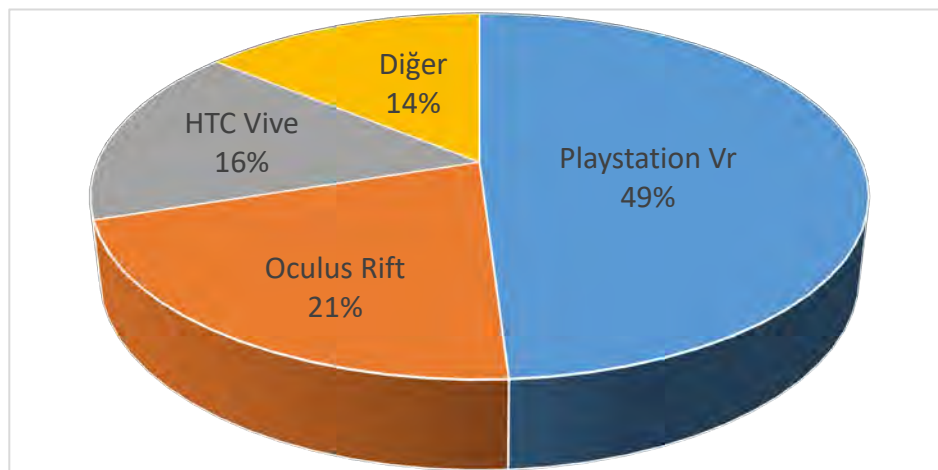


Figure 1. Market Share of VR Headsets
Source: https://www.digitaltrends.com/virtual-reality/playstationvr-outsells-htc-vive-oculus-rift/

In the figure, it can be seen that Playstation VR, which can be used only with Playstation Game Console, is the leader in the market. Oculus Rift, HTC Vive VR headsets also have a decent market share. Thus, it can be said that VR headsets' fist intended use is the VR games.

Oculus VR company started to developed Oculus VR in 2012 and released some prototypes in the process which can be bought by developers and enthusiasts. Facebook bought the Oculus VR company in 2014. Then the first Oculus Rifts were released to the end users in 2016. The Oculus Rift headset has an OLED panel for each eye which has resolution of 1080x1200, a

refresh rate of 90 Hz and 110 degree field of view (Desai, Desai, Ajmera, & Mehta, 2014). Figure 2 shows a picture of Oculus Rift Headset with two controllers and two trackers.



Figure 2. Oculus Rift Headset

Trackers can measure the coordinates of the headset and the controllers with millimetric accuracy in 3D space. Users interact with two controllers in the VR environment like holding an object or shooting a gun in a game. Of course, the primary development purpose of Oculus Rift is to be used in more realistic VR games. However, there are also lots of different uses of VR headsets like social virtual worlds, education, 3D films. Linden Lab and other virtual word firms like Facebook Spaces have plans for VR headsets integration. With some of them, it is already possible to use VR headsets.

HTC Vive is another important VR headset. Its development started in 2014 and released to end users in 2016. Like Oculus Rift, it has resolution of 1080x1200, a refresh rate of 90 Hz and 110-degree field of view for each eye. Oculus Rift and HTC Vive are desktop-based VR headsets which require a powerful computer with a powerful GPU.

Sony started to develop Playstation VR in 2014 and released to end users in 2016. Playstation VR designed to be used with Playstation Game Console. But it can be possible to use it with computers with an extra hardware. Playstation VR has an OLED panel for each eye which has resolution of 1920x1080, a refresh rate of 1200 Hz and 100-degree field of view.

It can be said that this is rather a new technology in its early stages. However, VR headsets can provide immersive 3D experiences to users who can play VR games or use other VR applications with high motivation and reality. Furthermore, educators and researchers in different fields are interested with VR headsets for educational and academic uses from psychology to anatomy.

A search in the database of Scopus using ( ( ABS ( "VR" OR "Virtual Reality" OR "augmented reality" ) AND ABS ( headsets OR headset OR glasses ) AND ABS ( education OR training OR learn OR learning OR train OR instruction OR instruct OR teaching OR teach ) ) AND ( LIMIT-TO ( SRCTYPE , "j" ) ) AND ( LIMIT-TO ( DOCTYPE , "ar" ) OR LIMIT-TO ( DOCTYPE , "re" ) ) revealed the results presented in Figure 3 regarding the number of related studies by year. This search tried to find articles and reviews about VR headset use in education. Besides, because the first prototypes were released in 2014, studies performed in 2014 and later were included in the search.
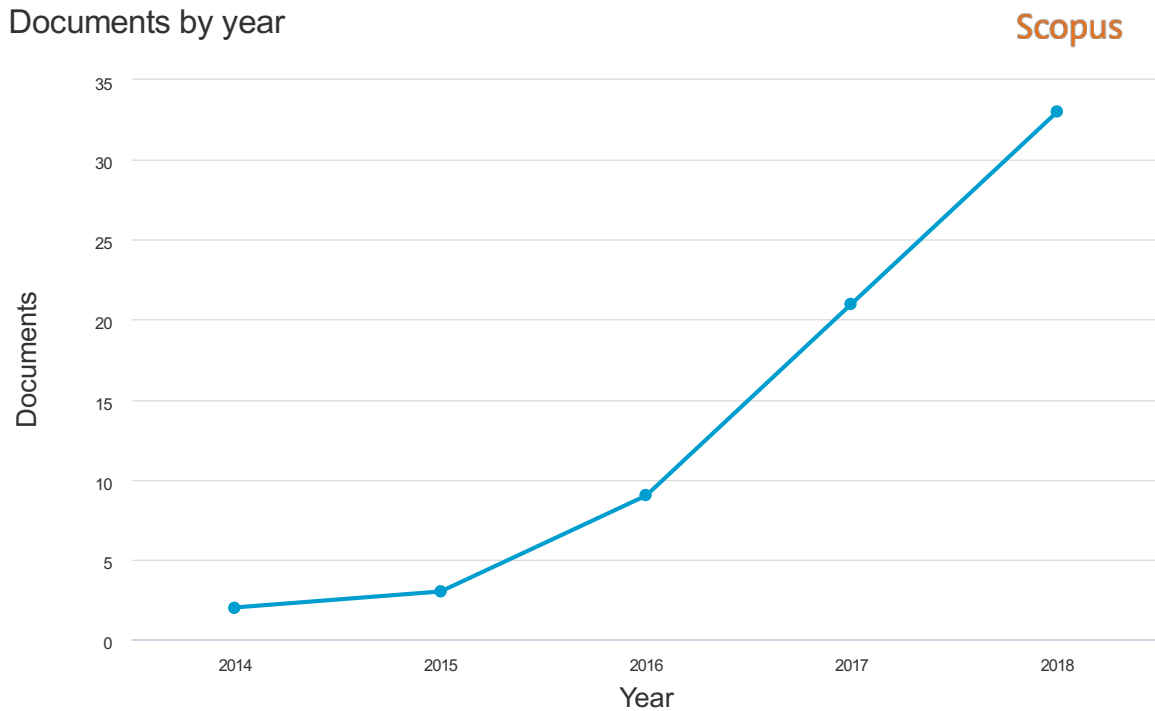
Documents by year



Figure 3. Number of Papers in Scopus Database

As can be seen in Figure 3, there has been a gradual increase in the number of studies conducted on VR headsets in education. Especially after 2016, these headsets became widespread, and their use in education increased gradually. When the related literature is examined, it can be seen that there is a need for an up-to-date study reviewing the related literature. By mapping known literature, this review will hopefully provide a timely insight into the current state of research on the use of VR headsets in education. In this respect, the purpose of the present study was to examine the studies on the use of VR headsets in education in Scopus database in terms of certain variables.

## 2. RELATED LITERATURE

In literature, there is not any systematic review article about the use of VR headsets in education. However, VR and AR are two concepts which are of great significance for VR headsets. Accordingly, in related literature, the review studies on VR and AR in education were examined. Therefore, the review studies conducted on these concepts are thought to be important to help understand the concepts.

Wang et al. (2018) examined 66 articles in the review study of the use of virtual reality in construction engineering education and training. The fist article was conducted in 1997 and after 2011, there were an important increase in the number of articles published. Naturally most of the studies used Desktop-based VR technology. 3D Game-Based VR and Augmented Reality are the other technologies used in fewer studies. Most of the studies are performed in the fields of Construction Engineering Education and then Construction Safety Training.

Another systematic literature review study was performed about VR and AR in tourism research (Yung & Khoo-Lattimore, 2017). They reached 46 papers as a result of the search in the databases of Scopus, EBSCO, Elsevier, Proquest, and Emerald. it was revealed that most of the studies were about virtual worlds, followed by virtual environments and augmented reality. They also found that the most studied topics were marketing and education, that the most

frequent research methods included conceptual papers (13 papers) and case studies (10 papers), that 73% of the papers used experimental design and only 11 of them had a theoretical background.

A systematic review study on AR use in education was performed with 68 articles published in SSCI journals (Akçayır & Akçayır, 2017). It was reported that the first articles were published in 2007 and especially after 2010 number of articles were increased significantly. They found that the participants in the studies were k-12 students (51%), undergraduate students (29%), adults (7%) and teachers (3%). The also stated that in the articles the most preferred delivery technology was mobile devices. They interpreted that mobile devices are ideal platforms for AR applications because of their cameras and mobility. In addition, regarding the depended variables, the researchers reported that 32 of them were about learners' achievement, 10 about motivation, 8 about enjoyment, 6 about engagement and 6 about attitude. They also found that among some articles it was reported that AR use in education could be some negative aspects like difficult to use for students, more time required, and low sensitivity in triggering recognition.

In a systematic review study about AR trends, 32 articles in 5 top journals about educational technology with high impact factors were examined (Bacca, Baldiris, Fabregat, Graf, & Kinshuk, 2014). They found that most of the studies were on science learning (13), humanities and arts (7), engineering (5) and social sciences. They also found that the participants in the studies were undergraduate students (11), primary school students (6), lower secondary school students (6) and upper secondary school students (4).  Also, according to the researchers, aims of the studies were about explaining the topic (14), augment information (13), educational game (6) and lab experiment (6). They found that 14 of them examined the variable of learning gains, 10 of them examined the variable of motivation, 6 of them examined the variable of collaboration and 5 of them examined the variable of interaction. Also, according to the researchers, studies reported that AR had positive influence on learning (17), motivation (9), engagement (5), attitude (4) and enjoyment (4). They also found that the sample sizes of the studies were between 20 and 200 in 25 studies, and 30 or less in 6 studies. They found that the most frequent research methods were mixed method (15), qualitative (11) and quantitative (6), respectively. They found that questionnaires (24), semi-structured interviews (9), survey (6) and observation (3) were used as data collection tools.

28 empirical research articles from 2010 to 2017 were reviewed in the review study about the use of AR technology to support science, technology, engineering and mathematics (STEM) learning (Ibáñez & Delgado-Kloos, 2018). Articles were retrieved from ACM Digital Library, ERIC, IEEExplore, ISI Web of Science, ScienceDirect, Scopus, and Springer databases. In these studies, observation (14 studies) was the most used instructional learning technique, inquiry (10) was the second. Research methods used in these studies are quantitative (13), qualitative (5) and mixed-method (10). Academic achievement (18) was the primary focus for most of the studies. Also, affective outcomes like motivation (7), enjoyment (5), Attitude (5) and engagement (5) were investigated

In an another  review study regarding using AR in education, 38 articles published in between 2016 and 2017 years and indexed in Web of Science and SSCI, SCI-EXPANDED, A&HCI, CPCI-S, CPCI-SSH, and ESCI databases, were examined (Rabia M. Yilmaz, 2018).  It was revealed that of all the studies, participants were primary school students (11), undergraduate students (10), high school students (5), secondary school students (4) and kindergarten students (4). The researcher reported that science education is the leading topic in the studies. She also

found that 23 of them examined the variable of academic achievement, 9 of them examined the variable of motivation and 6 of them examined the variable of attitude.

## 3. METHODOLOGY

In this study, a systematic review study was performed with a content analysis on papers, published in academic peer reviewed journals indexed in the database of Scopus, regarding the concept of the use of VR headsets in education. In content analysis, researchers try to interpret the data by coding and determining themes through the systematic classification process (Hsieh & Shannon, 2005, p.1278). With content analysis it is possible to summarize a large volume of literature. Researches in the field can use the results of this type of study to direct their future studies (Petticrew & Roberts, 2006).

Articles were searched with the following criteria in mind: being published in a peer reviewed journal, being written in English and being published in between 2014 and 2019. To find the appropriate articles, a search was performed in the Scopus database. Scopus is the largest database including peer-reviewed articles in academic journals from all over the world (Buyukkol Kose, Cetin, & Yunkul, 2018). To reach all the articles about the use of VR headsets in education, various concepts such as VR, AR, headsets, glasses, education, etc. were used in the search statement. The purpose of the search was to find all of the articles about the use of VR headsets in education. The search statement used was as follows:

> ( ABS ( "VR" OR "Virtual Reality" OR "augmented reality" ) AND ABS ( headsets OR headset OR glasses ) AND ABS ( education OR training OR learn OR learning OR train OR instruction OR instruct OR teaching OR teach ) ) AND ( LIMIT-TO ( SRCTYPE , "j" ) ) AND ( LIMIT-TO ( DOCTYPE , "ar" ) OR LIMIT-TO ( DOCTYPE , "re" ) ) AND ( LIMIT-TO ( LANGUAGE , "English" ) ) AND ( LIMIT-TO ( PUBYEAR , 2019 ) OR LIMIT-TO ( PUBYEAR , 2018 ) OR LIMIT-TO ( PUBYEAR , 2017 ) OR LIMIT-TO ( PUBYEAR , 2016 ) OR LIMIT-TO ( PUBYEAR , 2015 ) OR LIMIT-TO ( PUBYEAR , 2014 ) )

72 articles were found in the search. 69 of them were accessed as full-text, and because three articles were not reached as full-text articles, they were excluded from the study. Finally, a total of 69 articles were downloaded and examined. Consequently, 20 articles were excluded because it was decided that they were not about the use of VR headsets in education. Figure 4 summarizes the overall research process.

Figure 4. The Overall Research Flow

As a result, content analysis was conducted with 49 full-text articles which were examined thoroughly. Percentages and frequencies were given about the participants, data collection tools, variables/research interests and research methods/designs in the articles. The findings were interpreted and compared with the results of other similar studies in literature.

### 3.1. Reliability

An excel table was prepared with the codes and the information of articles downloaded. The articles were analyzed one by one by the researcher and two colleagues separately. And all of them prepared their own excel tables with analyzed information. Three tables were checked about the differences which were resolved with a consensus by the researcher and two colleagues. The content analysis was finalized with the consensus about all the findings.

## 4. FINDINGS and DISCUSSIONS

In this section, the participants, data collection tools, variables/research interests and research methods/designs in the articles were reported. Distribution of the articles was given in Figure 5 by year.
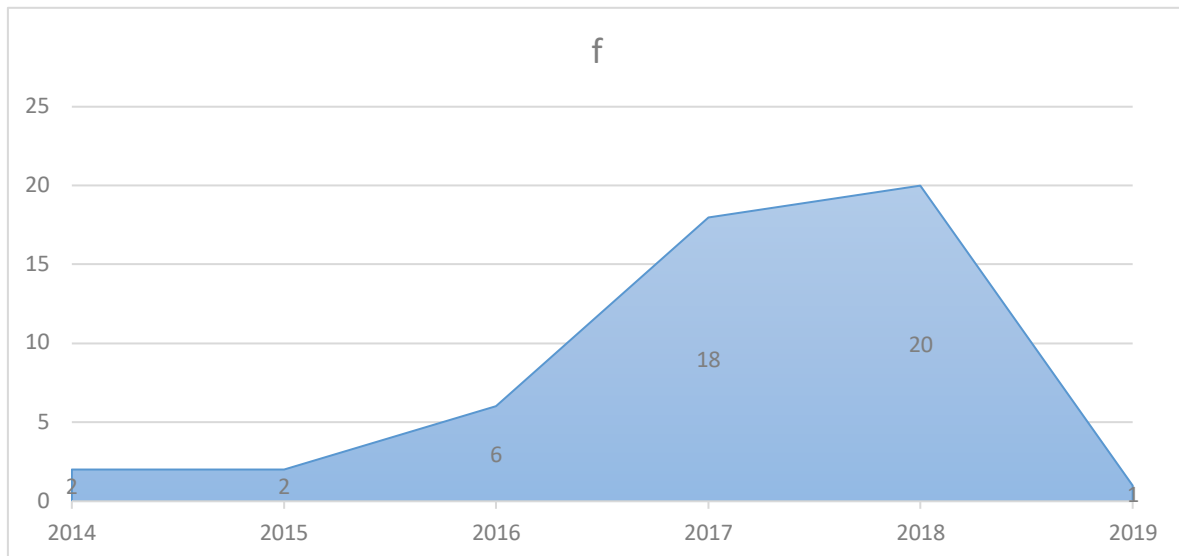
Figure 5. Number of Publications in the Use of VR Headsets in Education Topic

According to the figure above, 2018 was the most productive year. Especially after 2016, the number of published articles increased gradually. The search was performed in January of 2019, so it can be said that number of articles in 2019 did not represent the real value. Besides it could be stated that there has been a gradual increase in the number of studies.

### 4.1. Most Cited 5 Studies

The studies included in the study were also examined with respect to the number of times that they have been cited, and the most cited 5 studies are presented in Table 1.

*Table 1. List of The Most Cited Publications*

| Publication Name | Authors | Journal | Cited by | Research Methods | Main Focus of The Study |
|---|---|---|---|---|---|
| Virtual reality and augmented reality in plastic surgery: A review | (Kim, Kim, & Kim, 2017) | Archives of Plastic Surgery | 15 | Systematic review | The article describes a systematic literature review conducted to investigate the state-of- the-art VR/AR technology relevant to plastic surgery. |
| Computer-assisted culture learning in an online augmented reality environment based on free-hand gesture interaction | (Yang & Liao, 2014) | IEEE Transactions on Learning Technologies | 14 | Experimental | The aim of the study is to incorporate the latest AR and CV algorithms into a Virtual English Classroom, called VECAR, to promote immersive and interactive language learning. |
| Augmented reality assisted surgery: A urologic training tool | (Dickey et al., 2016) | Asian Journal of Andrology | 13 | Survey | In the study, the authors developed an application for use on Google Glass® optical head-mounted display to train urology residents in how to place an inflatable penile prosthesis. |
| Head-mounted display-based intuitive virtual reality training system for the mining industry | (Zhang, 2017) | International Journal of Mining Science and Technology | 11 | Survey | By employing a VR headset, a smartphone and a leap motion device, an HMD based intuitive type VR training system prototype for drilling in underground mines has been developed |
| Using Technology to Meet the Challenges of Medical Education | (Guze, 2015) | Transactions of the American Clinical and Climatological Association | 10 | Literature review | This article presents how the use of technologies can provide the infrastructure and basis for addressing many of the challenges in providing medical education for the future. |

In Table 1, it can be seen that the most cited article was a systematic literature review performed with the Conceptual/Descriptive methods. The second most cited article was an experimental study with pretest and posttest groups. It can be seen that more than half of the articles in the list were performed with quantitative methods. Of all the most cited five studies, three of them were about medical education. It can be said that researchers in medical education field, showed great interest in the use of VR headsets in education.

### 4.2. Keyword Analysis
The major topics covered in the articles were determined with keyword analysis. The result of the analysis was given in Figure 6.
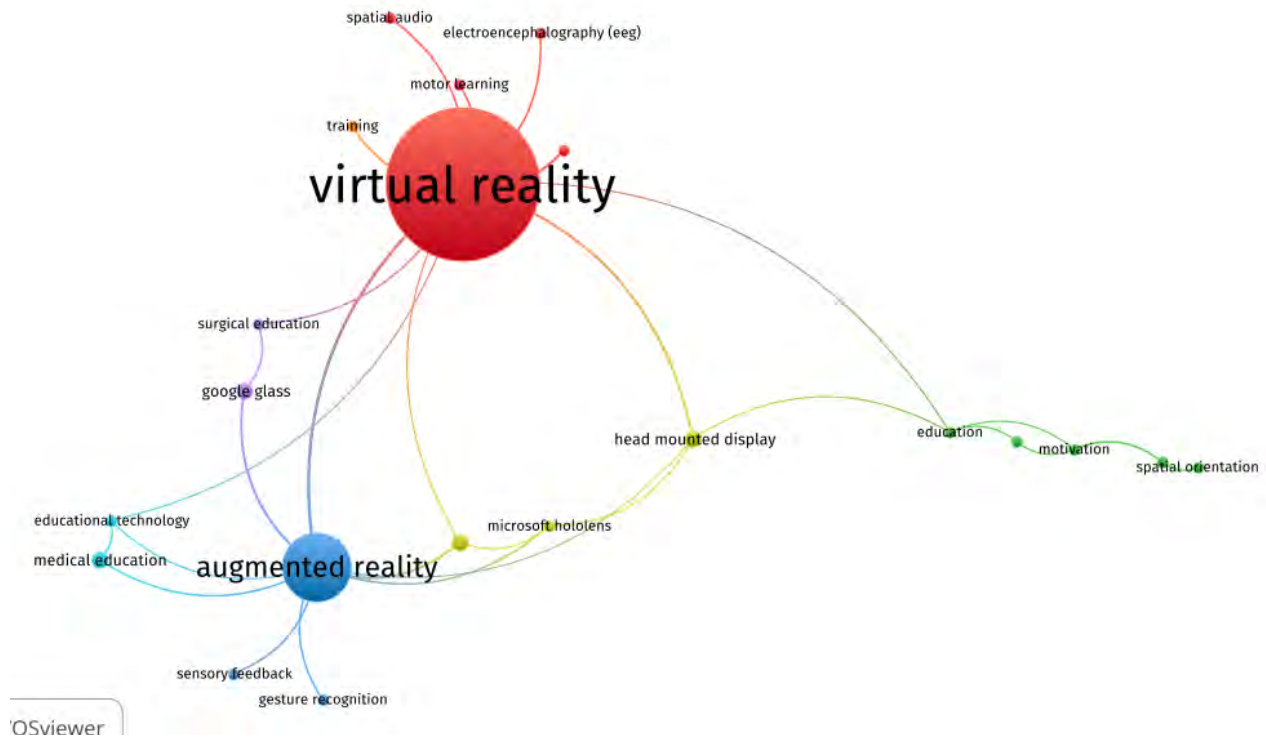
Figure 6. Major Topics Covered

Radius of the circles represents frequency. In addition, colors and lines represent groups and relationships. According to the frequencies of the keywords, it was seen that concepts such as VR and AR were prominent. In review studies conducted on VR and AR in education in related literature, it was seen that they did not include any keyword analysis. However, in general, it can be stated that keywords such as head mounted display, Microsoft hololens, google glass, medical education, educational technology, surgical education, education, training, motivation, etc. are popular keywords in this field. Different from that, it can be said that the VR and AR are the most preferred keywords in the articles about the use of VR headsets in education.

### 4.3 Participants

The frequencies and percentages about the types of participants in the articles were given in Table 2.

*Table 2. Participants*

| Participants | Frequency | Percentage | Sample Size |
|---|---|---|---|
| Undergraduate students | 20 | 50 | 10-769 |
| Adults | 16 | 40 | 1-115 |
| K-12 Students | 2 | 5 | 25-437 |
| Academician | 2 | 5 | 11-30 |

*In a study, more than one target group type could be used

According to the data presented in Table 2, it was seen that undergraduate students (N=20) and adult learners (N=16), were the most preferred participant types which constituted 90% of all the participants.

Undergraduate students and adult learners were used more. It was thought that it is not surprising that undergraduate students can be easy to access for academicians, and because

quite number of studies were about medical education, their samples were mostly adult patients. The finding about undergraduate students being favored most in the studies is parallel to the findings of other review studies (Akçayır & Akçayır, 2017; Bacca et al., 2014; Rabia M. Yilmaz, 2018).

### 4.4. Data Collection Tools

Frequencies and percentages of the types of data collection tools utilized in the studies were presented in Table 3.

*Table 3. Data Collection Tools*

| Data Collection Tools | Frequency | Percentage |
|---|---|---|
| Pretest-posttest | 14 | 26,5 |
| Questionnaire | 13 | 24,6 |
| Interview | 11 | 20,7 |
| Scale | 9 | 17,0 |
| Focus Group | 3 | 5,6 |
| Observation | 3 | 5,6 |

*In a study more than one data collection tools could be utilized.

According to Table 3, pretest-posttest (26,5 %), questionnaire (24,6 %), interview (20,7 %) and scale (17,0 %) were the most favored data collection tools used in these studies. Academic achievement tests, questionnaire and interview were the most common data collection tools. This result was similar with the results of other research (Bacca et al., 2014; Ibáñez & Delgado-Kloos, 2018).

### 4.5. Variables/Research Interests

Table 4 presents the frequencies and percentages of dependent variables used in the studies. While some studies used more than one dependent variable, in some studies especially qualitative and review studies, no dependent variable was used.

*Table 4. Variables / Research Interests*

| Dependent Variables | f | % |
|---|---|---|
| Usability | 11 | 24,4 |
| Experience | 9 | 20,0 |
| Academic-performance | 8 | 17,8 |
| Perception | 5 | 11,1 |
| Skill development | 5 | 11,1 |
| Engagement | 3 | 6,8 |
| Self-efficacy | 2 | 4,4 |
| Others | 2 | 4,4 |

*In a study more than one dependent variable could be used.

According to Table 4, usability (24,4 %) was the most favored dependent variable used in 11 studies. This variable was followed by "experience" (20,0 %) in 9 studies, "academic performance" (17,8 %) in 8 studies and perception (14,2 %) in 5 studies. Usability, experience and academic performance constituted more than half of all the variables. Other studied in related literature mostly focused on academic performance, motivation, engagement and attitude variables. Different from that, in this study, usability and experience were the most interested variables. It can be stated that it is not surprising that researchers tend to investigate

the usability and experience dimensions of newly released technological tools for educational purposes.

**4.6. Research Method and Design**

Table 5 presents frequencies and percentages of Research Methods/Designs used in the studies.

*Table 5. Frequencies of Research Methods/Designs*

| Method | f | % | Model/Design | f | %CUM | %TOTAL |
|---|---|---|---|---|---|---|
| Quantative | 25 | 52 | Survey | 8 | 32 | 16 |
| | | | Experimental | 17 | 68 | 35 |
| | | | Causal Comparative | 0 | 0 | 0 |
| | | | Correlational | 0 | 0 | 0 |
| | | | Meta-analysis | 0 | 0 | 0 |
| Qualitative | 7 | 14 | Case Study | 7 | 100 | 14 |
| | | | Content Analysis | 0 | 0 | 0 |
| | | | Etnography | 0 | 0 | 0 |
| | | | Descriptive | 0 | 0 | 0 |
| | | | Phenomenology | 0 | 0 | 0 |
| | | | Grounded Theory | 0 | 0 | 0 |
| | | | Meta-synthesis | 0 | 0 | 0 |
| | | | Historical | 0 | 0 | 0 |
| | | | Heuristic | 0 | 0 | 0 |
| Mixed | 6 | 12 | xplanatory sequenti | 3 | 50 | 6 |
| | | | Embedded | 1 | 17 | 2 |
| | | | Convergent Parallel | 1 | 17 | 2 |
| | | | xploratory Sequenti | 0 | 0 | 0 |
| | | | Multiphase | 1 | 17 | 2 |
| | | | Transformative | 0 | 0 | 0 |
| Conceptual/ Descriptive /Other | 11 | 22 | Opinion Paper | 0 | 0 | 0 |
| | | | Literature Review | 3 | 27 | 6 |
| | | | Report | 0 | 0 | 0 |
| | | | Reflection Paper | 5 | 45 | 10 |
| | | | Comparative | 0 | 0 | 0 |
| | | | Technical Paper | 1 | 9 | 2 |
| | | | Position Paper | 0 | 0 | 0 |
| | | | Field Notes | 0 | 0 | 0 |
| | | | Systematic Review | 2 | 18 | 4 |

Table 5 shows that quantitative methods (52%) were the most preferred research methods, while researchers used only experimental (n=17) and survey (n=8) studies as model/design in quantitative methods. 22% of studies preferred conceptual/descriptive (%22) research paradigm, and reflection paper (n=5) was the most preferred model/design. Popularity of research methods and models can be similar or different in other review studies. In some review studies, mixed methods (Bacca et al., 2014; Gurhan Durak, Çankaya, Yünkül, & Misirli, 2018) were used more, and in some other studies, the Conceptual/Descriptive methods (Gürhan Durak & Çankaya, 2018b, 2018a; Yung & Khoo-Lattimore, 2017) were favored more. Similar to the present study's findings, in a review studies carried out by Ibáñez and Delgado-Kloos (2018), quantitative methods were used more.

## 5.  CONCLUSION and SUGGESTIONS

This study examined 49 articles to determine the trends in studies about the use of VR headsets in education. The findings revealed that from 2014 to 2019, there was a positive trend in the number of studies by year. According to the findings it was found that quantitative methods were used in more than half of the studies. 22% of the studies preferred conceptual/descriptive methods. It can be said that this is an expected finding, because experimental methods are preferred frequently in the studies which are supposed to have practical implementations. When the most cited five studies were examined, it was seen that 2 studies were performed with survey research model found under the category of Quantitative methods. On the other hand, the most cited study preferred systematic review model/design. It can be said that systematic review studies are supposed to be cited more than other type of studies, because they summarize a lot of studies and guide other researchers in the field. This study is also a systematic review study which reveals the current state of research on the use of VR headsets in education. As a result of the keyword analysis, it was found that VR and AR were the most preferred ones. It can be said that this is an expected result that VR headsets are used in VR and AR environments. In addition, it was found that undergraduate students and adult learners were the most preferred participant types in studies, and pretest posttest and questionnaire were the most preferred data collection tools.

It was appeared that there was not any systematic review study about the use of VR headsets in education topic. Therefore, the present study is going to be the first. According to the findings, the following suggestions were made for researchers who intent to work on this field:

- Less used dependent variables can be focused in the future studies for maximum variety to investigate different aspects of the topic.

- According to the findings it was found that the least favored research method was the mixed method, which have advantages of both quantitative and qualitative methods. Therefore new mixed method studies can be performed with multiple data collection tools to gather more in-depth data.

- This study was based on the articles accessed with a search query in Scopus database. A new content analysis can be performed with a search in different databases.

## Eğitimde Sanal Gerçeklik Gözlüklerinin Kullanımı: Sistematik Derleme Çalışması

**Özet**

Son yıllarda sanal gerçeklik teknolojilerinin kullanımının önemli derecede arttığı görülmektedir. Özellikle sanal gerçeklik gözlüklerinin, sanal gerçeklik ve arttırılmış gerçeklik uygulamaları için önemli cihazlar haline geldiği söylenebilir. Bu gelişmelerin bir sonucu olarak araştırmacılar, sanal gerçeklik gözlüklerini çok farklı alanlarda araştırmaya başlamışlardır. Bu bağlamda bu araştırmanın amacı, Scopus veritabanında yer alan, 2014 ile 2019 yılları arasında yayınlanan ve sanal gerçeklik gözlüklerinin eğitimde kullanımı ile ilgili olan makalelerin içerik analizini gerçekleştirmektir. Toplam 49 makaleye ulaşılmış ve bu makaleler; konu alanları, araştırma yöntemleri, en çok atıf alan makaleler, veri toplama araçları, katılımcılar ve değişkenler bakımından incelenmiştir. Bu konu ile ilgili alanyazında daha önce yapılan bir sistematik derleme çalışması olmadığı için, bu çalışmanın önemli olduğu düşünülmektedir. Sonuç olarak eğitimde sanal gerçeklik gözlüklerinin kullanımı ile ilgili çalışmaların yıllara göre bir artış gösterdiği görülmektedir. Ayrıca, araştırma yöntemi olarak nicel yöntemlerin, katılımcı olarak lisans öğrencilerinin ve veri toplama aracı olarak ise öntest-sontest ölme aracının makalelerde en çok tercih edildiği ortaya çıkmıştır. Bununla birlikte kullanılabilirlik ve deneyim, en çok araştırılan bağımlı değişkenler olmuşlardır.

**Anahtar kelimeler:** araştırma eğilimleri, içerik analizi, sanal gerçeklik gözlükleri, sistematik derleme

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